

REMARKS/ARGUMENTS

At the outset, applicants wish to thank Primary Examiner Clifford C. Shaw for the courtesies extended during the personal interview held on November 4, 2003 with the undersigned attorney. The Primary Examiner's careful attention to the application on that occasion was sincerely appreciated.

Claims 1-14 were rejected under 35 USC 103(a) as being unpatentable over MATSUI et al. 5,525,778. The Official Action states that Figure 10 and the discussion at column 11, line 40 through column 13 of the patented reference discloses a method and device with an arrangement to determine pulse frequency at 61, and arrangement to determine wire feed speed at 44, and a current adjustment means 66, which will necessarily determine the mean or RMS values of the welding current. The claims are stated to differ from MATSUI et al. in setting forth an equation relating wire feed speed to current values, and in calling for welding particular metals in the dependent claims. It is advanced that to the extent that the equations relate arc current to wire feed speed, they are expressing the fact that when consumable wire electrode arc welding is in a steady state, the wire melting rate must be in balance with the wire feed rate. It is considered obvious that the system of MATSUI et al. will be operated in a steady state since this is the most efficient way to weld. When operating in a steady state, then the wire melting

rate would be in balance with the wire feed rate, and obviously the equations recited in applicants' claims would be satisfied.

Reconsideration of the above rejection is respectfully requested for the following reasons.

As was explained during the interview, the MATSUI et al. reference is completely silent about any existing relationship or link between the current values and the wire speed values during an arc welding process.

However, as is clearly explained on page 4 of the original specification, it is generally not easy to determine the synergic curves of a pulsed MIG/MAG welding system or process (see page 2, lines 35-38 and page 3, lines 1-6 of the specification) as this determination is quite difficult to carry out. It is empirical and can only be accomplished by carrying out numerous trials, the number of which is proportional to the number of parameters to be taken into account (see page 4, lines 16-24).

The problem solved by the present invention was to propose a welding process that avoids making numerous trials, but leads to an efficient synergic control of the welding parameters including the current, and the wire speed, while keeping in mind that a good pulsed-current synergic control should lead to a single detachment per pulse, to a spatter free welding, and to a

small arc height, as set forth on page 3, lines 22-25 of the specification.

A careful review of the MATSUI et al. reference will reveal that the goal of this document was to propose a welding process leading mainly to an adequate weld thickness and a good mechanical strength (see column 1, lines 60-63), to an optimum pulse form (column 2, line 4), and to a low inclusion of blowholes in the weld (column 2, lines 25-26).

The solution provided by MATSUI et al. is based on a control of the pulse periods and duration, of the arc length and of the peak current value.

However, as is recognized in the Official Action, MATSUI et al. are silent about any existing relationship between I values and wire speed (V_{wire}).

The only speed disclosed in MATSUI et al. in column 16, line 1 is the welding speed, and not the wire speed, which are not the same. Thus, it would appear that the wire speed is not considered to be an important parameter within the framework of the MATSUI et al. reference.

In any event, and in order to advance prosecution of this application, it will be seen that newly-presented independent claim 15 includes the subject matter formerly recited in claims 1, 5, 6 and 7, thereby reciting specific values for the wire speed, the pulse frequency, and the ratio of the RMS current

value to the mean current value. Claims 16-28 correspond to former claims 2-14.

As is reflected in the Examiner Interview Summary Record (PTOL-413), the Primary Examiner kindly indicated that newly-presented independent claim 15 distinguished over the prior art of record. Since dependent claims 16-28 depend directly or indirectly from an otherwise allowable independent claim 15, they are likewise believed to be patentable by virtue of this dependency.

In view of the recent interview, the present amendment, and the foregoing remarks, therefore, it is believed that this application has been placed in condition for allowance. Entry of the present amendment, reconsideration, and allowance are accordingly earnestly solicited.

In the event there are any questions relating to this amendment or to the application in general, it would be appreciated if the Examiner would telephone the undersigned attorney concerning such questions so that the prosecution of this application may be expedited.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any

overpayment to Deposit Account No. 25-0120 for any additional
fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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